REMARKS/ARGUMENTS

In the Specification:

A new title, "METHOD OF DIFFUSING METALS USING PHOTO-THERMAL ENERGY," was suggested. The CFR requires the title "be as short and specific as possible." 37 C.F.R. § 1.72(a) (2004). The MPEP provides the title should be "brief but technically accurate and descriptive preferably from two to seven words." MPEP 601, ***Content*** (A) (Seventh Edition, Rev. 1, 2000). The original title, "PHOTO-THERMAL INDUCED DIFFUSION," is short, as specific as possible, and technically accurate. The specification and claims discuss applying photo-thermal energy to a first and second material to induce diffusion. Contrary to the suggested title, "METHOD OF DIFFUSING METALS USING PHOTO-THERMAL ENERGY," the application is not limited to metals. The original title is short and specific to the method disclosed. Applicant respectfully asserts the original title is proper.

In the Claims:

Claims 1-5 and 11 remain in this application. Claims 6-10 and 12-26 have been canceled. Claims 3 and 4 have been amended. Claims 27-30 are new.

Claim Objections

Claims 3 and 4 were objected to because of informalities. As requested, claim 3 has been amended by deletion of "first layer" and replacement with "layer of first material". Claim 4 has been amended by deletion of "metal trace" and replacement with "electrically conductive trace". No new matter has been added to claim 3 or claim 4.

35 USC § 102 Rejections

Claims 1-4 and 11 were rejected under 35 U.S.C. 102(b) as being anticipated by Mori et al. (US 5,821,627) (hereinafter "Mori"). (Office Action at Page 3).

Independent claim 1 recites at least "applying photo-thermal energy to a layer of first material disposed on a layer of second material". Independent claim 11 recites a similar limitation.

Contrary to the Examiner's statement that all elements of claim 1 are disclosed in Mori, "applying **photo**-thermal energy to a layer of first material **disposed on a layer of second material to** diffuse a portion of the first material into the second material" (emphasis added) is not disclosed; the rejection is unsupported by the art and should be withdrawn. Mori fails to disclose applying photo-thermal energy to a first material when that material is disposed on a layer of second material to diffuse a portion of the first material into the second material, as recited in the claim. Mori's disclosure of heating two metals that are in contact to diffuse the metals (Mori, col. 10 lines 7-11) does not use "photo-thermal energy." Mori's disclosure of heating a metal using an infrared ray occurs when the metals that are to be diffused are not in contact (Mori, col. 16 lines 21-30).

Further, the heating method disclosed in Mori cannot be "applying photo-thermal energy to a layer of first material disposed on a layer of second material to diffuse a portion of the first material into the second material" because, when the two metals to be diffused are in contact, the photo-thermal energy would be blocked by either a passive chip element 511 or a substrate 513. (Mori, Figs. 5 and 6C).

Thus, independent claim 1 is patentable over Mori. Accordingly, independent claim 11 is also patentable over Mori.

Claims 2-4 depend from independent claim 1. Based at least in part on their dependencies, claims 2-4 are also patentable over Mori.

Dependent claim 3 recites that the diffusing of the first material into the second material, "forms an electrically conductive trace." Mori fails to disclose this; the rejection is unsupported by the art and should be withdrawn. Mori's disclosure of heating a metal bump with an infrared ray (Mori, col. 16 lines 21-30) does not teach diffusing two metals that are in contact or forming an electrically conductive trace. Instead, Mori discusses solid-phase diffusion bonding between an existing wiring layer and a bump. (Abstract).

Claim 4 depends from dependent claim 3. Claim 4 is also patentable over Mori based at least in part on its dependency on claim 3.

35 USC § 103 Rejection

Claim 5 was rejected under 35 U.S.C 103(a) as being unpatentable over Mori et al.

Claim 5 depends from claim 1. As discussed, independent claim 1 is patentable over Mori. Based at least in part on its dependency, claim 5 is also patentable over Mori.

Further, the application of the rule in *In re Aller,* is misapplied in the present case. In *In re Aller*, the claimed invention and prior art were identical processes for decomposition of hydroperoxides into phenol and acetone using sulphuric acid, except the claimed invention incorporated lower temperatures and higher acid concentrations.

In re Aller, 220 F.2d 454, 455, (CCPA 1955). In the present case, the claimed invention and prior art are not identical except for a slight variation of known variables. Mori discusses solid-phase diffusion bonding between a wiring layer and a bump. (Abstract). The claimed invention discusses using photo-thermal energy to form electrically conductive traces of mixed-material composition. (Abstract). Since the general conditions of the claimed invention are not disclosed in the prior art, the rule in *In re Aller* is misapplied and the conditions claimed are patentable over Mori.

Conclusion:

Applicant respectfully submits that claims 1-5, 11, and 27-30 are patentable, and accordingly, the application is now in condition for allowance. Early issuance of the Notice of Allowance is respectfully requested.

The Commissioner is hereby authorized to charge shortages or credit overpayments to Deposit Account No. 500393. A Fee Transmittal is enclosed in duplicate for fee processing purposes. The Examiner is invited to call Michael Plimier at (408) 765-7857 if there remains any issue with allowance of this case.

Respectfully submitted,

INTEL CORPORATION

Dated: 3/31, 2004

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